NATIONAL UNIVERSITY OF SINGAPORE

CS1231S – DISCRETE STRUCTURES
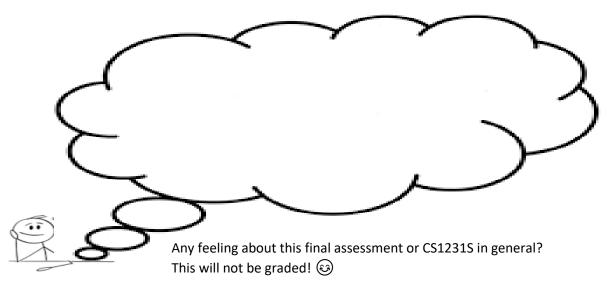
(Semester 2: AY2023/24)

Final Assessment Answer Sheets

Time Allowed: 2 Hours

INSTRUCTIONS

1. Write your **Student Number** on the right. Do not write your name.

2. Check that you have written your Student Number correctly. No mark will be awarded for this assessment if we are unable to identify you with your Student Number.

3. These answer sheets comprise **FOUR (4) pages**.

4. All questions must be answered in the space provided; no extra sheets will be accepted as answers.

5. You must submit only these **ANSWER SHEETS** and no other documents.

6. An excerpt of the question may be provided to aid you in answering in the correct box. It is not the exact question. You should still refer to the original question in the question paper.

7. You may write your answers using pencil (at least 2B) or pen as long as it is legible (no red ink, please).

8. The maximum mark for this paper is 100.

9. **Marks may be deducted** for (i) illegible handwriting, and/or (ii) excessively long answer.

10. Each multiple choice question is intended to have only one answer. Please shade the appropriate bubble using pencil only.

My Student Number:

A | | | | | | | | |

For Examiner's Use Only		
Question	**Marks**	**Remarks**
Q1-24	/ 48	
Q25	/ 6	
Q26	/ 6	
Q27	/ 20	
Q28	/ 20	
Total	**/ 100**	

Any feeling about this final assessment or CS1231S in general? This will not be graded! 😊

Part A: Multiple Choice Questions (Total: 48 marks)

Please shade only ONE bubble for each question. <u>Please use ONLY pencil (2B and above) to shade</u>.

	(A)	(B)	(C)	(D)	(E)
1.	○	○	○	○	○
2.	○	○	○	○	○
3.	○	○	○	○	○
4.	○	○	○	○	○
5.	○	○	○	○	○
6.	○	○	○	○	○
7.	○	○	○	○	○
8.	○	○	○	○	○
9.	○	○	○	○	○
10.	○	○	○	○	○
11.	○	○	○	○	○
12.	○	○	○	○	○

	(A)	(B)	(C)	(D)	(E)
13.	○	○	○	○	○
14.	○	○	○	○	○
15.	○	○	○	○	○
16.	○	○	○	○	○
17.	○	○	○	○	○
18.	○	○	○	○	○
19.	○	○	○	○	○
20.	○	○	○	○	○
21.	○	○	○	○	○
22.	○	○	○	○	○
23.	○	○	○	○	○
24.	○	○	○	○	○
	(A)	(B)	(C)	(D)	(E)

Part B (Total: 52 marks)

25. [6 marks]

(a)
[1]
If R is reflexive, then S is reflexive.

(b)
[1]
If R is irreflexive, then S is irreflexive.

(c)
[1]
If R is symmetric, then S is symmetric.

(d)
[1]
If R is transitive, then S is transitive.

(e)
[1]
If R is antisymmetric, then S is antisymmetric.

(f)
[1]
If R is asymmetric, then S is asymmetric.

26. [6 marks]

(a)
[1]
$g^{(3)}(21) =$

(b)
[2]
Order of 3 is _____

(c)
[3]
Equivalence classes:

27. [20 marks]

(a) [3]

(b) [3] %

(c) [3]

(d) [3]

(e) [3]

(f) [1]

(g) [4]

28. [20 marks]

(a) [2] Weight of MST:

(b) [3]

(c) [3] Postorder:

(d) [2] Cut-vertices:

(e) [3] Cutsets:

(f) [3] Induced subgraphs:

(g) [4]

=== END OF PAPER ===